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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,072	11/12/2003	Nicolas J. Moll	10003976-4	6364

7590 05/18/2006

AGILENT TECHNOLOGIES, INC.  
Intellectual Property Administration  
Legal Department, DL429  
P.O. Box 7599  
Loveland, CO 80537-0599

EXAMINER

FARAHANI, DANA

ART UNIT	PAPER NUMBER
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2891

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/706,072	Applicant(s) MOLL ET AL.	
	Examiner Dana Farahani	Art Unit 2891	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 March 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/12/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8, 10-19 and 21 are rejected under 35 U.S.C. 102(e) as being unpatentable over High Performance InP/GaAsSb/InP DHBTs With Heavily Doped Base Layers, a paper submitted by applicants in the Information Disclosure Statement submitted to the Office on 11/12/03, by Bolognesi et al., hereinafter the primary reference, a previously cited referenced.

Regarding claims 1, 8, 10, 12, 19 and 21, the reference discloses in figure 1, a heterojunction bipolar transistor (HBT) comprising:

a collector;

an emitter; and

a base located between the collector and the emitter, the base including a layer of gallium arsenide antimonide (GaAsSb) (see page 13, the last paragraph) less than 49 nanometers (nm) thick, and is carbon doped.

The primary reference does not expressly state the base doping concentration is greater than  $2.5 \times 10^{20}$ .

The primary reference discloses a base doping of  $2.5 \times 10^{20}$  (see the above mentioned portion of the reference), further disclosing that a very high base doping concentration produces

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excellent sheer resistance values (see page 13, the last full paragraph), further disclosing base concentration greater than  $2.5 * 10^{20}$  produces greater conductivity values (figure 3), which as persons with ordinary skill in the art would appreciate, is a much desired property. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the base doping concentration greater than  $2.5 * 10^{20}$  in order to increase conductivity and also produce new desired higher values of  $f_{MAX}$  (see page 14, the last three lines).

Regarding claims 2-6 and 13-17, the reference discloses arsenic fraction in a range from about 50% to about 51%; about 50% to about 60%; about 54% to about 56%; and approximately 55% (see the above noted section of the reference).

Regarding claims 7, 11 and 18, The primary reference discloses the claimed invention, as discussed above, except for expressly disclosing the base is less than 20 nm thick. It would have been obvious to one of ordinary skill in the art at the time of the invention to make the base less than 20 nm thick, sine the prior art has a 20 nm thick base, which is negligibly close to a base of less than 20 nm thick.

3. Claims 9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the primary reference, as applied to claims 1 and 7 above, and further in view of Stanchina et al., hereinafter Stanchina (US Patent 5,349,201), previously cited.

The primary reference discloses the claimed invention, as discussed above, except for the base layer is doped with Be.

Stanchina discloses at column 3, lines 39-47, an HBT with Be doped GaAsSb base layer provides improved performance over conventional HBTs by increasing the hole mobilities and valence band offset. Therefore, it would have been obvious to one of ordinary skill in the art at

the time of the invention to use this material in the HBT structure of the primary reference to increase the performance of the structure.

***Response to Arguments***

4. Applicant's arguments with respect to the previously rejected claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

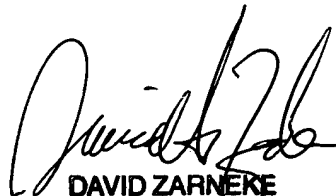
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D. Farahani

  
DAVID ZARNEKE  
PRIMARY EXAMINER  
5/12/06